

CLAIMS

1. A rack-mountable in-line surge protection system comprising:
a chassis configured to mount to an equipment rack, the chassis including:
5 an electrically-conductive buss;
an electrically-conductive ground member coupled to the buss and
configured and disposed to be connected to a grounding mechanism; and
a plurality of electrically-conductive bias members coupled to the buss;
and
10 a plurality of surge-protection modules configured to be removably inserted into
and coupled to the chassis, the modules each including a printed circuit board and a
plurality of receptacles for receiving connectors and coupling the connectors to the
circuit board, the circuit boards each including a grounding contact portion and surge
protection circuitry;
15 wherein the chassis and the modules are configured such that the circuit boards
are disposed between respective bias members when inserted in the chassis, with the
grounding contact portion of each circuit board in electrical contact with at least a
respective one of the bias members.
- 20 2. The system of claim 1 wherein the chassis is configured with a plurality of
guides for guiding the printed circuit boards of the modules into the chassis and in
between the bias members.
3. The system of claim 2 wherein the chassis provides slots with walls of the
25 slots serving as the guides.
4. The system of claim 1 wherein the grounding contact portions of the
printed circuit boards extend at least as far as a distance between locations where the bias
members contact the circuit boards the modules are fully inserted into the chassis.
- 30 5. The system of claim 1 wherein at least one of the module and the chassis
includes a member for interfering with the other of the module and the chassis with the

module received by the chassis to inhibit separation of the module from the chassis.

6. The system of claim 5 wherein each module includes a bias arm for engaging a ledge of the chassis to retain the modules in the chassis.

5

7. The system of claim 6 wherein the bias arms are configured to deflect in response to a threshold of force being applied to the modules to permit removal of the modules from the chassis.

10 8. A chassis for use in a rack of electronic data communications equipment and with modules configured for data communications, the chassis comprising:

a housing configured to provide a plurality of openings sized and shaped to receive the modules, and configured to be mounted in the rack;

15 an electrically-conductive buss coupled to the housing and extending along a length of the housing;

an electrically-conductive ground member coupled to the buss and configured and disposed to be connected to a grounding mechanism; and

20 a plurality of electrically-conductive bias members coupled to the buss and configured and disposed to contact and be biased against portions of respective circuit boards of the modules with the modules received by the chassis.

9. The chassis of claim 8 wherein the bias members are disposed in opposing pairs.

25 10. The chassis of claim 9 wherein two pairs of the bias members are disposed to receive each circuit board.

11. The chassis of claim 8 wherein the housing provides guides for guiding the circuit boards into contact with the bias members.

30

12. The chassis of claim 11 wherein the housing defines a plurality of slots with the walls of the slots serving as the guides.

13. The chassis of claim 12 wherein the housing defines a top and a bottom slot for each of the circuit boards.

5 14. A replaceable module for use with a rack-mountable data communications chassis that provides a plurality of openings each configured for receiving the module, the module comprising:

a circuit board configured to provide surge-protection between an input and an output; and

10 a housing connected to the circuit board, the housing defining a plurality receptacles for receiving a plurality of data connectors, the receptacles disposed such that connectors received by the receptacles will electrically couple to the input and the output, respectively, of the circuit board, the housing including an inhibiting member configured and disposed to interfere with a portion of the chassis with the module received by the
15 chassis such that separation of the module from the chassis is inhibited.

15 15. The module of claim 14 wherein the inhibiting member is flexible and includes a tab, the inhibiting member being configured to have the tab urged inwardly by the chassis during insertion of the module into the chassis and to move outwardly when the tab aligns with an opening provided by the chassis such that the tab will interfere with the chassis if the module and chassis are urged to separate.

16. The module of claim 15 wherein the tab is rounded.

25 17. The module of claim 14 wherein the housing includes a plurality of grip portions configured to be grasped by a user for pulling the housing to separate the module from the chassis.

30 18. The module of claim 17 wherein the grip portions provide grooves extending transverse to a direction of insertion of the module into the housing.

19. The module of claim 18 wherein the housing provides two grip portions

that extend away from a front face of the housing and that are disposed near a top and a bottom of the housing, respectively.

20. A rack-mountable in-line surge protection system comprising:
- 5 a chassis configured to mount to an equipment rack, the chassis providing a plurality of receptacles, the chassis providing a grounding network from an interior of the chassis to a terminal configured to be connected to by an external ground connector; and
- a plurality of modules configured to be repeatedly inserted into and removed from the receptacles, the modules each being configured to connect to a plurality of data
- 10 line connectors, and to provide a surge-protected electrical connection between the plurality of connectors connected to each module;
- wherein the modules and the chassis are configured such that the modules and the chassis will inhibit separation of the modules and the chassis if the modules are urged to separate from the chassis, and to allow separation of the modules from the chassis upon
- 15 application of at least a threshold separation force.

21. The system of claim 20 wherein the chassis and the modules are configured such that the threshold separation force is at least about 1 pound.

- 20 22. The system of claim 21 wherein the chassis and the modules are configured such that the threshold separation force is at least about 2 pounds.

23. The system of claim 20 wherein the chassis has a height of about 1U.

- 25 24. The system of claim 20 wherein surge protection of different modules is configured differently to provide surge protection for different types of data lines, and wherein the modules each include a visual indication of a type of data line for which the surge protection of the respective module is configured.

30